

Claims

What is claimed is:

1. A mower comprising:

a plurality of wheel assemblies, each wheel assembly associated with a corresponding wheel, a corresponding electrical steering motor, and a corresponding electrical drive motor,

a controller for controlling a steered direction of the corresponding wheel via the corresponding electrical steering motor and application of electrical energy to the corresponding electrical drive motor consistent with maneuvering the mower in accordance with a movement mode in any desired direction along the ground;

a propulsion unit for rotating at least one cutting blade;

a mowing deck for housing the at least one cutting blade, the mowing deck having indentations to provide a spatial zone for the plurality of wheel assemblies; and

a frame for supporting the plurality of wheel assemblies, the propulsion unit, and the mowing deck.

2. The mower according to claim 1 wherein the movement mode is selected from the group consisting of a linear mode, an arc mode, a rotating mode, and a trim mode.

3. The mower according to claim 1 wherein the movement mode comprises a linear mode in which all of the wheels are oriented parallel to one another with respect to their respective steering axes.

4. The mower according to claim 1 wherein the movement mode comprises a rotating mode in which the wheels are oriented generally tangential to a circular region about the mower.

5. The mower according to claim 1 wherein the movement mode comprises an arc

mode in which each wheel is generally tangential to a corresponding arc associated with a corresponding radius extending from a reference point.

6. The mower according to claim 1 wherein the movement mode comprises a trim mode in which a critical point of the mowing deck faces a boundary to be trimmed, the critical point associated with the outermost cutting edge of the at least one cutting blade.

7. The mower according to claim 1 wherein the mowing deck comprises three generally semi-circular sections having corresponding centerpoints that are substantially equidistant to a geometric center point of the mower.

8. The mower according to claim 7 wherein each generally semi-circular section contains a generally vertical shaft coupled to a cutting blade, a periphery of the mowing deck having the indentations as open regions between adjacent semi-circular sections.

9. The mower according to claim 7 wherein the wheels are free from mechanical interference to rotate with respect to a steered axis over a range of at least ninety degrees.

10. The mower according to claim 1 wherein the wheels are oriented generally tangentially to a circular region about a geometric center point of the mower to provide a zero turn radius for the movement of the mower.

11. The mower according to claim 1 wherein the wheels are rotatable with respect to a steered axis over at least three-hundred and sixty degrees.

12. The mower according to claim 1 such that the at least one cutting blade provides a swath that is greater than or equal to a wheel spacing of the wheels.

13. The mower according to claim 1 such that the at least one cutting blade provides a swath that is greater than or equal to a spacing between outer sides of the wheels in at least a rotating mode and a linear mode.
14. The mower according to claim 1 wherein the propulsion unit comprises an engine selected from the group consisting of an internal combustion engine, a diesel engine, a gasoline engine, an alternating current electrical motor, direct current electrical motor, an induction motor, and an electrical motor.
15. A method for trimming vegetation with a mower, the method comprising:
positioning a critical point of a mower over or adjacent to a reference axis of rotation of the mower;
orienting each wheel of the mower generally tangentially to one or more corresponding arcs about the reference axis of rotation; and
controlling the application of rotational mechanical energy to one or more of the wheels to rotate the mower about the reference axis of rotation by a desired revolutionary amount.
16. The method according to claim 15 wherein the positioning of the critical point comprises positioning an edge or outer periphery of a mowing deck of the mower as the critical point.
17. The method according to claim 15 wherein the positioning of the critical point comprises positioning an outer edge of a cutting blade as the critical point.
18. The method according to claim 15 further comprising:
identifying a target area for application of a zero radius trim prior to executing the positioning, orienting, and controlling, the target area comprising a portion of a work area to be serviced by the mower.
19. The method according to claim 18 wherein the target area represents a remnant

unmowed region of the work area.

20. A method for trimming vegetation with a mower, the method comprising:
 - positioning a critical point of a mower over a reference arc;
 - aligning a steered direction of orientation of wheels to be generally tangential to respective arcs that are generally concentric with respect to the reference arc; and
 - controlling an application of rotational mechanical energy to one or more of the wheels to propel or rotate the mower about the object by a desired revolutionary amount.
21. The method according to claim 20 wherein the positioning of the critical point comprises positioning an edge or outer periphery of a mowing deck of the mower as the critical point.
22. The method according to claim 20 wherein the positioning of the critical point comprises positioning an outer edge of a cutting blade as the critical point.
23. The method according to claim 20 further comprising:
 - identifying a target area for application of the near zero radius trim.
24. The method according to claim 20 wherein the target area comprises a unmowed region around an object.
25. The method according to claim 20 further comprising:
 - aligning the arc with a minimum radial clearance around an object that provides sufficient clearance between the object and the mower to avoid bumping, scuffing, abrading or other contact with the object.
26. The method according to claim 20 further comprising:
 - aligning the arc with a minimum radial clearance around the object that provides sufficient clearance between the object and an outer edge of cutting blades

closest to the outer periphery of the mower.